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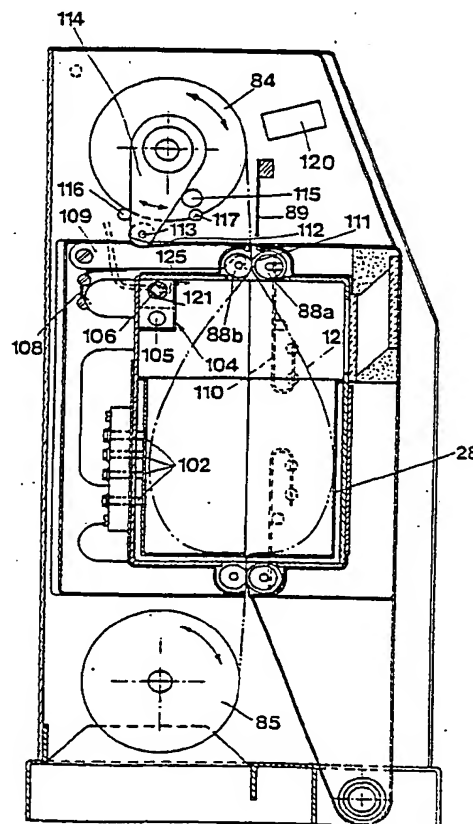
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(54) Title: AN APPARATUS FOR AUTOMATICALLY MAKING FOOD PRODUCTS SUCH AS BREAD, CAKES AND THE LIKE

(57) Abstract

An apparatus for automatically making food products in piece form from dough-like substances comprising a housing containing holding means (11) adapted to be affixed to either end of a flexible sealable bag (12) containing the ingredients for the dough-like substance, and a dough preparation station (13) having an upper and a lower slit forming slit openings (86); kneading means for mechanically working the ingredients in said bag, said kneading means including the holding means (11) and slit openings (86), and means for creating relative oscillating movement between the bag and the slit openings so that the ingredients are kneaded into a dough-like substance; and a heat treating station (14) in said housing whereby the kneaded dough-like substance is treated, said slit openings (86) each being defined by two guiding means such as sliding surfaces (87) or rollers (88). At least one of the guiding means (87, 88) of at least the upper slit is moveable relative to the other guiding means in that pair so as to allow gas to escape from the bag at the desired time.



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AN APPARATUS FOR AUTOMATICALLY MAKING FOOD PRODUCTS SUCH AS
BREAD, CAKES AND THE LIKE

TECHNICAL FIELD

An apparatus for automatically making food products in piece form from dough-like substances comprising a housing containing holding means adapted to be affixed to either end of a flexible sealable bag containing the ingredients for the dough-like substance, and a dough preparation station having an upper and a lower slit forming slit openings, kneading means for mechanically working the ingredients in said bag, said kneading means including the holding means and slit openings, and means for creating relative oscillating movement between the bag and the slit openings so that the ingredients are kneaded into a dough-like substance; and a heat treating station in said housing whereby the kneaded dough-like substance is treated, said slit openings each being defined by two guiding means such as sliding surfaces or rollers.

BACKGROUND OF THE INVENTION

Baking e.g. bread for household purposes is a relatively complicated, time consuming, work intensive and messy business. By the fact that the quality of the bread to a certain extent depends on the fermentation time and that the fermentation procedure is performed under correct conditions, which takes a relatively long time, there are few people that have the privilege of eating fresh home-made bread for breakfast.

In the EP-A-0 113 327 there is disclosed a baking apparatus of the above mentioned kind which can produce bread automatically without soiling various vessels and utensils, as the mixing and kneading operations of the dough takes place in a flexible sealable bag containing the necessary ingredients for the dough.

SUMMARY AND ADVANTAGES OF THE INVENTION

The object of the invention is to provide a baking apparatus of the above mentioned kind which allows ventilation of the bag in order to allow gas to escape formed e.g. during the fermentation of the dough.

This is achieved by the fact that at least one of the guiding means of at least the upper slit being moveable relative to the other guiding means in that pair so as to allow gas to escape from the bag at the desired time.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows a section through a first embodiment of the baking apparatus.

Figure 2 is a section according to the line II-II in fig. 1.

Figure 3 is a section according to the line III-III in fig. 2.

Figure 4 shows a section through a second embodiment of the baking apparatus.

Figure 5 shows a part of the baking oven of fig. 4.

Figure 6 is a perspective view of a bag used in the baking apparatus according to the invention.

Figure 7 shows a section through a third embodiment in which the baking oven is movable with respect to the fixed vessel.

DESCRIPTION OF PREFERRED EMBODIMENTS

The baking apparatus is basically of the type described in EP-A-0 113 327 and consists of holding means 11, a flexible bag 12 attachable thereto and a common dough preparation and heat treatment station 13, 14. The whole arrangement is located inside a thermally insulated casing 15.

The flexible bag 12, an embodiment of which is shown in fig. 6 is used as a transportation package for the dry ingredients from the producer to the user and as a vessel during the preparation of the dough and possibly also during the baking. The bag 12 must therefore withstand rough mechanical treatment

and preferably also contains a second bag or a separate compartment, in which is contained the liquid required for preparation of the dough. The compartments containing the dry ingredients and the baking liquid respectively are separated by e.g. a weld joint which in burst when the kneading operation starts. Alternatively, the liquid for the dough can also be added through a nozzle, especially if the liquid is only water. The bag 12 is attached to of least two holding means 11 which are so formed that the end pieces of the opening 18 of the bag can be squeezed between gripping jaws 17.

The programmer interrupts the dough preparation after an empirically pre-determined dough preparation time so that no overworking of the dough occurs which could lead to dry bread. Already during the preparation of the dough the heater 23 in the heat treatment station 14 can be started in order to obtain an appropriate fermentation time. The dough can be made to ferment several times possibly interrupted by new kneading operations according to the inserted program. When the fermentation of the dough is finished the baking takes place directly in the combined dough preparation - and baking station 13,14.

The embodiment shown in fig. 1 comprises a common dough preparation and heat treatment station 13,14 consisting of two housing halves 81,82 of which the first one 81 is stationary while the second one 82 is displaceable or rotatable with respect to the stationary half. In the embodiment shown the movable housing half 82 is rotatable about a vertical hinge so that the dough preparation and heat treatment stations 13,14 and the holding means can be reached.

The mixing of the ingredients and the dough preparation is accomplished by attaching the upper end portion of the bag 12 to a holding means 11 at an upper rotatable cylinder 84, while the lower end of the bag in a corresponding way is attached to another holding means 11 at a lower rotatable cylinder 85. The cylinders 84 and 85 are driven by a reversible motor (not

shown) about one revolution, after which the motor is reversed. In this way the bag 12 is given an oscillating up and downwards movement. The bag must pass through an upper and a lower slit-shaped opening 86 between the housing halves 81 and 82, which only permits a substantially empty bag to pass. This means that the content of the bag - the dough - alternatively will be kneaded against the upper and lower part of the inner walls of the baking oven 14, where the slit 86 is located. In order to reduce the friction between the bag and the edge between the slit and the inner wall, these parts are provided with or rolls 88 a and b.

Practical test have proved that a very effective mixing and kneading of the dough is achieved by this very simple device, even if the dough is relatively stiff.

The bags with the ingredients are preferably delivered hermetically sealed and if the baking recipe prescribes that the preparation of the dough and/or the baking should be made under atmospheric conditions it is appropriate to arrange a perforation and/or cutting device 89, which can perforate the bag in a certain position, so that the interior of the bag will communicate with the atmosphere.

In the embodiment shown in figures 1-3 a baking tin 28 is arranged in the common dough preparation and heat treatment station 13, 14. The baking tin 28 also consist of two parts, e.g. hingedly connected to each other along the same parting line as the housing halves 81, 82. The baking tin 28 can be removed from the housing 81, 82 for washing purposes.

It can sometimes be necessary to ventilate the bag 12 during the mixing- and kneading operation due to formation of gas in the dough. One of the rolls 88 a in each pair of rolls 88 between which the bag 12 passes is therefore displaceable in an inclined oblong groove 100, so that when the bag 12 is unrolled from the respective rotatable cylinders 84 or 85 the respective pair of rolls 88 is permitted to move apart a few millimeters, so that gas may escape between the rolls 88 a and

b and out of the bag through e.g. perforations 108 (fig.6). The opposite pair of rolls 88 are at the same time pressed together against the bag 12 and seal the opening thereof. If any dough would pass between the rolls 88a and b it will be allowed to pass back when the bag 12 is unrolled from the cylinders 84 or 85 and the rolls 88a and b are moved apart.

A similar function can be provided in other ways, e.g. by making one of the rolls 88 in each pair of rolls 88 spring-loaded and actuated by an electromagnet.

A cutting device 89 in the form of a heating filament is arranged to open the bag 12 after the mixing- and kneading operation is finished. The dough is then pressed out of the bag 12 and is spread in the baking tin 28 when the bag is reeled on the rotatable roll 85 and removed from the dough preparation and heat treatment station 13,14 before the fermentation takes place.

A number of sensors, e.g. fotocells 101, are arranged to detect the rise level of the dough in order to determine when the fermentation is sufficient. Apertures 102 are provided in the walls of the dough preparation - and heat treatment station 13,14 and in the baking tin 28 just opposite the fotocells 101.

A temperature sensor 103 sensing the temperature in the dough preparation and heat treatment station 13,14 is also provided.

A steam generator 104 is arranged in the dough preparation and heat treatment station 13,14 and is arranged to introduce steam into said station during and/or after the baking operation in order to produce a crust and/or glossy surface on the bread. The steam generator 104 (see also fig. 4) comprises a heating rod 105 and a tube 106 which is perforated 121 and communicates with a water container 122 through a valve 123 controlling the supply of water to the steam generator 104. Water can be filled through an opening covered by a lid 124. The steam generated in the steam generator 104 can escape

through a slit 125.

In the embodiment shown in figures 4 and 5 the ventilation of the bag 12 is provided by means of a spring-loaded 108 lever arm 109 actuating the spring-loaded 110 roll 88a. The other roll 88b is fixed. The lever arm 109 has a surface 111 bearing against the roll 88a and is on its side facing the roll 88 provided with a small recess 112 with a slanting approach along which a roll 113 attached at an actuator in the form of a presser cam 114 can be moved. The presser cam 114 is rotatably attached to the hub of the cylinder 84 and is actuated by a driving pin 115 attached to the cylinder 84. Two stops 116 and 117 limits the movement of the presser cam 114.

In the position shown in fig. 4 the roll 113 of the presser cam 114 is located in the recess 112 of the lever arm 109, which in this position does not exert any pressure on the roll 88a, which therefore is pressed against the fixed roll 88b by the spring 110. When the cylinder 84 is rotated in counter clockwise direction the bag 12 is moved upwards between the rolls 88a and b, which are pressed against each other, and when the driving pin 115 reaches the presser cam 114 this will be moved together with the roll 84 until it reaches the stop 17. The roll 113 is then moved from the recess 112 and along the approach thereof, at which the lever arm 109 will be pressed downwards and exert a pressure on the roll 88a, which will be moved apart from the fixed roll 88b a short distance (fig. 5).

The motor is then reversed and the cylinder 84 is rotated in clockwise direction, while the lever arm 109 will remain in the position shown in fig. 5 until the driving pin 115 reaches the presser cam 114 and forces it to move to the position shown in fig. 4 at which the lever arm 109 releases the roll 88a. Thus during the time the bag 12 is unrolled from the cylinder 84 the rolls 88a and b are moved apart allowing ventilation of the bag and/or the passage of possible dough rests in the bag that might have come along with the bag.

The gas may escape out of the bag 12 through perforations 118 (fig. 6), which before use of the bag are covered by an adhesive tape 119 or the like. Alternatively the upper edge which seals the bag 12 is torn away before the bag is attached to the cylinder 84 and 85 between gripping jaws 17 (fig. 1). One or both gripping jaws 17 can be provided with a cogging or similar irregularities, so that gas may escape therebetween.

A bar code scanner 120 reading a bar code 121 applied or printed on the upper portion of the bag 12 (see fig. 6) is arranged just opposite the upper cylinder 84. The bar code 120 contains the baking program, such as mixing and kneading time, speed of the cylinders, fermentation time and temperature, baking time and temperature, steam generation etc. The bar code scanner 120 initiates the programmer which takes care of the whole production process. It is important to note that the bar code 121 is read before the bag 12 is wound up on the cylinder 24, which can stretch the bag and destroy the bar code symbols.

The cutting device 89 in the embodiment of fig. 4 consists of a bimetallic member which when heated will bend and be brought into contact with the bag and cut this off. The bag 12 will then be wound up on the roll 85, while the dough remains in the baking tin 28.

Alternatively the attachment of the bag 12 at the upper cylinder 84 is released after finished kneading operation and the bag is wound up in the lower cylinder 85 at the same time as the dough is pressed out of the upper open end of the bag. The gripping jaws 17 can e.g. be actuated by an electromagnet. In this case the cutting device 89 can be eliminated.

In order to prevent any dough rests to penetrate between the lower pair of rolls 88 during the fermentation and baking it can be appropriate not to wound the entire emptied bag 12 on the cylinder 84, but to leave the free end of the bag between the rolls 88 as a sealing.

In figure 6 is shown a perspective view of a bag 12 containing the dry ingredients for the dough and an inner bag 97 with the baking liquid. The sealed upper said lower side edges of the bag 23 may be provided with perforations 107. The bag 12 may at its upper portion be provided with a bar code 121 as described above. The liquid may instead be contained in a separate compartement in the lower part of the bag, separated from the dry ingredients by a preelable seal which is burst when the bag passes between the rolls 88.

Another alternative embodiment of the baking apparatus is shown in fig. 7, where the bag is stationary, i.e. it is at its upper and lower ends attached to appropriate holding means 11, while the combined dough preparation and heat treatment station 13,14 in its two-piece design is movable in the longitudinal direction of the bag 12. This displaceability of the baking oven is provided by means of two spindles 95 arranged on opposite sides of the baking oven and rotatable by means of a motor 42, the spindles cooperating with nuts 96 fixedly attached to the outer casing of the baking oven. With the up-and downwards movement of the baking oven a bag 97 with the baking liquid will in the same way as in the embodiment according to Figures 1-5 and in cooperation with the slide members 87 a and b in the slits 86 burst the bag 97 so that its contents, i.e. the liquid can mix with the dry ingredients in the plastic bag 12. One of the slide members 87a is displaceable a short distance away from the other slide member 87b, so that gas may escape between the slide members.

The invention is not limited to the embodiments described and shown but a plurality of modifications and combinations of details from the different embodiments are possible within the scope of the claims. It would e.g. be possible to have the heat treatment station separated from the dough preparation station, at which the prepared dough is pressed out of the bag into a baking tin placed in the heat treatment station. The heat treatment station may consist of a baking oven which is displaceable from a position in which it can receive the dough from the bag to baking position or alternatively the baking

tin is displaceable with respect to the heat treatment station.

The baking apparatus may further be provided with a fan which leads air into a hollow bottom plate of the apparatus for cooling the electronic components and ventilating the baking oven after the baking.

CLAIMS

1. An apparatus for automatically making food products in piece form from dough-like substances comprising a housing containing holding means (11) adapted to be affixed to either end of a flexible sealable bag (12) containing the ingredients for the dough-like substance, and a dough preparation station (13) having an upper and a lower slit forming slit openings (86); kneading means for mechanically working the ingredients in said bag, said kneading means including the holding means (11) and slit openings (86), and means for creating relative oscillating movement between the bag and the slit openings so that the ingredients are kneaded into a dough-like substance; and a heat treating station (14) in said housing whereby the kneaded dough-like substance is treated, said slit openings (86) each being defined by two guiding means such as sliding surfaces (87) or rollers (88),
c h a r a c t e r i z e d i n ,
that at least one of the guiding means (87,88) of at least the upper slit being moveable relative to the other guiding means in that pair so as to allow gas to escape from the bag at the desired time.
2. An apparatus as claimed in claim 1,
c h a r a c t e r i z e d i n ,
that one of said guiding means (87,88) is by a spring (110) held against the other fixed guiding means and that actuating means (109,114) are arranged for making the moveable spring-loaded guiding means (87,88) to cause said guiding means to move apart from the other guiding means when the bag (12) passes therebetween towards the interior of the dough preparation station (13).
3. An apparatus as claimed in claim 1 or 2 and in which said holding means are cylinders (84,85), each with attachment means (17) for affixing said bag (12) thereto, said upper and lower cylinders (84,85) being rotatable in unison and the

rotation being reversed in alternating fashion so that said bag (12) is oscillated up and down through said pair of guiding means (88),

characterized in,

that said actuating means (109, 114) are associated with the respective cylinder (84) in such a way that in or near one reversing position of the cylinder (84) the actuating means (109, 114) are arranged to cause the movable guiding means (88a) to move apart from the fixed guiding means (88b) and in or near the other reversing position of the cylinder (84) they are arranged to release the moveable guiding means (88a).

4. An apparatus claimed in claim 3,

characterized in,

that said actuating means comprises an actuator (114) arranged on the hub of the cylinder (84) and which by a driving pin (115) or the like attached to the cylinder (84) is arranged to rotate between two end positions during the last part of the rotation of the cylinder (84) before this is reversed, said actuator (114) bearing against a spring-loaded lever arm (109), which bears against the moveable guiding means (88a), so that in one end position of the actuator (114) the lever arm (109) presses said guiding means (88b) apart from the fixed guiding means and in the other end position of the actuator (114) the lever arm (109) releases said moveable guiding means (88a).

5. An apparatus as claimed in claim 2,

characterized by,

that said actuating means comprises an electromagnet.

6. An apparatus as claimed in any of the preceding claims,

characterized in,

that sensor means (102) are positioned in a wall of said heat treatment station (14), which sensor means detect the rise level of said kneaded dough-like substance.

7. An apparatus as claimed in claim 6,

characterized in,

that a plurality of said sensor means (102) are vertically arranged so as to sense the height of said kneaded dough-like substance.

8. An apparatus as claimed in any of the preceding claims, characterized in, that temperature sensing means (103) are positioned in a wall of said heat treatment station (14) for detecting the temperature of said kneaded dough-like substance as it is treated.
9. An apparatus as claimed in any of the preceding claims, characterized in, that a steam generator (104) is arranged for introducing steam into the heat treatment station (13) during treatment of said kneaded dough-like substance.
10. An apparatus as claimed in claim 9, characterized in, that said steam generator (104) comprises a heating element (105) and means (106) arranged thereabove for distributing water over said heating element, said distributing means (106) communicating with a water container arranged outside of said heat treatment station (14).
11. The apparatus as claimed in any of the preceding claims, characterized in, that a bar code scanner (120) is arranged outside said slit (86) near the holding means (11) for reading a bar code (121) arranged on the bag (12), said bar code scanner (120) being connected to program means for the operation of the apparatus.

FIG 1

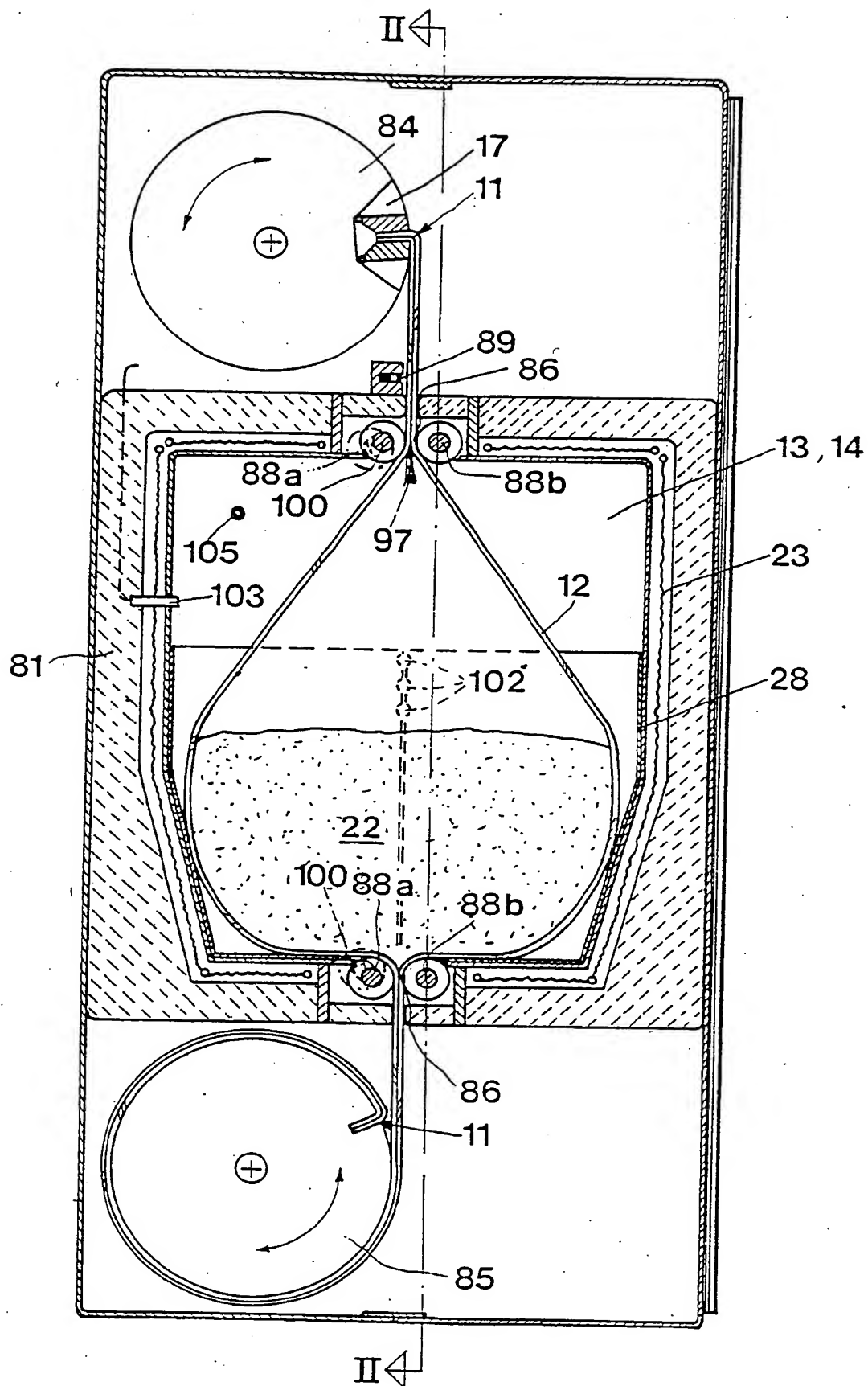


FIG 2

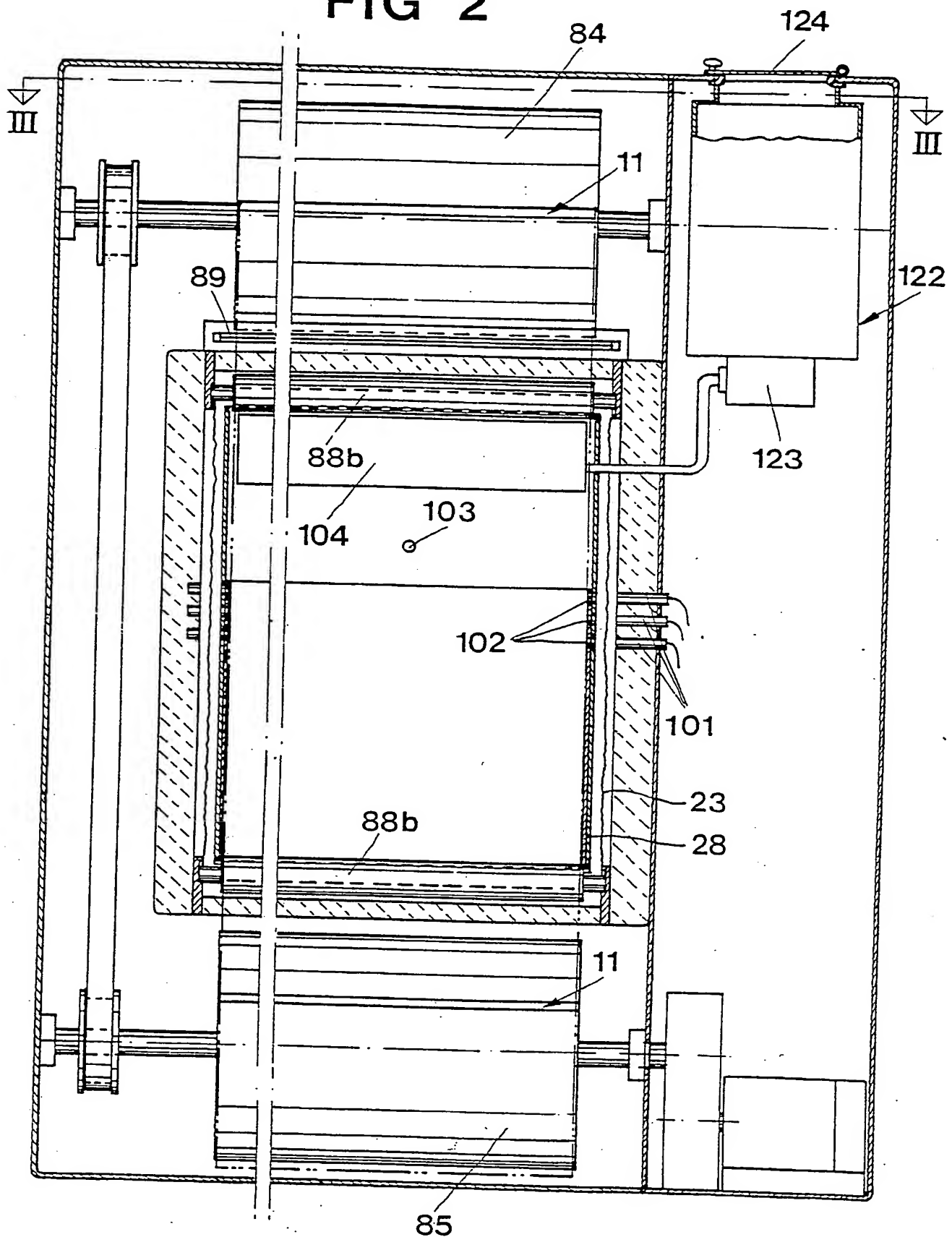


FIG 3

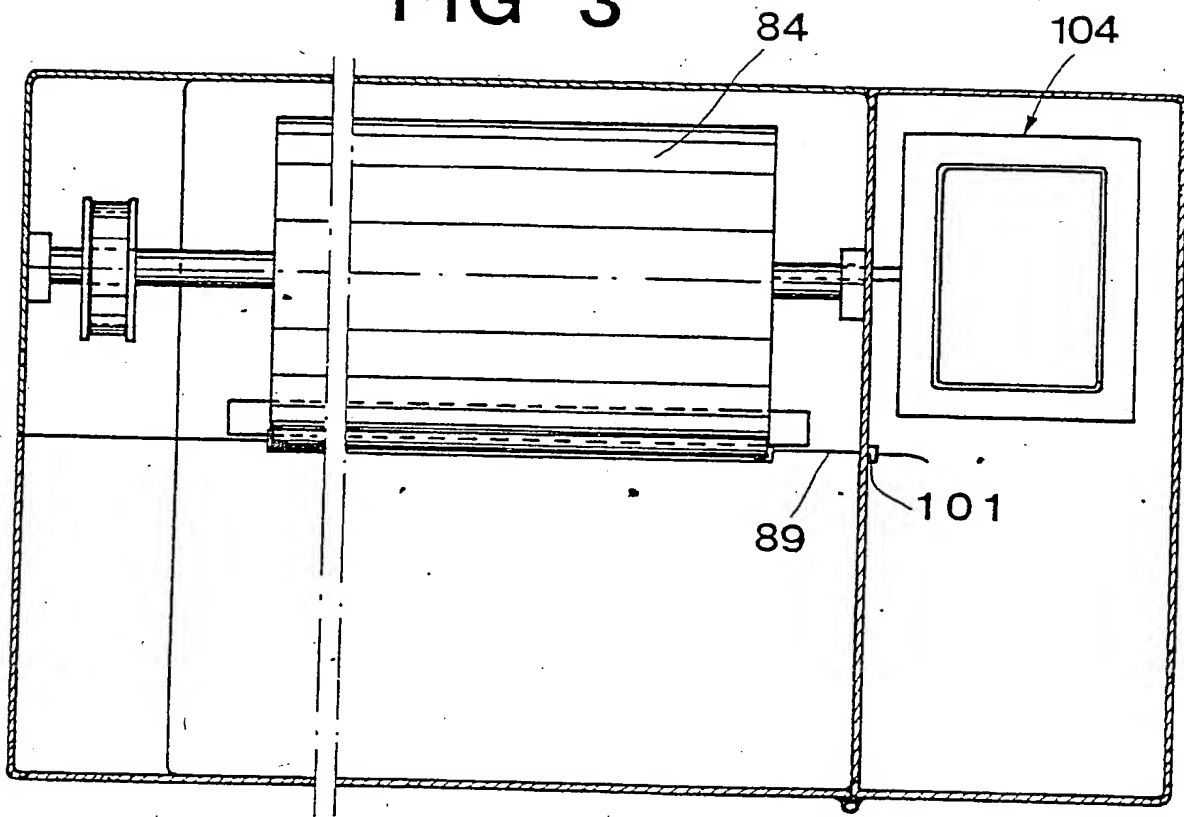


FIG 4

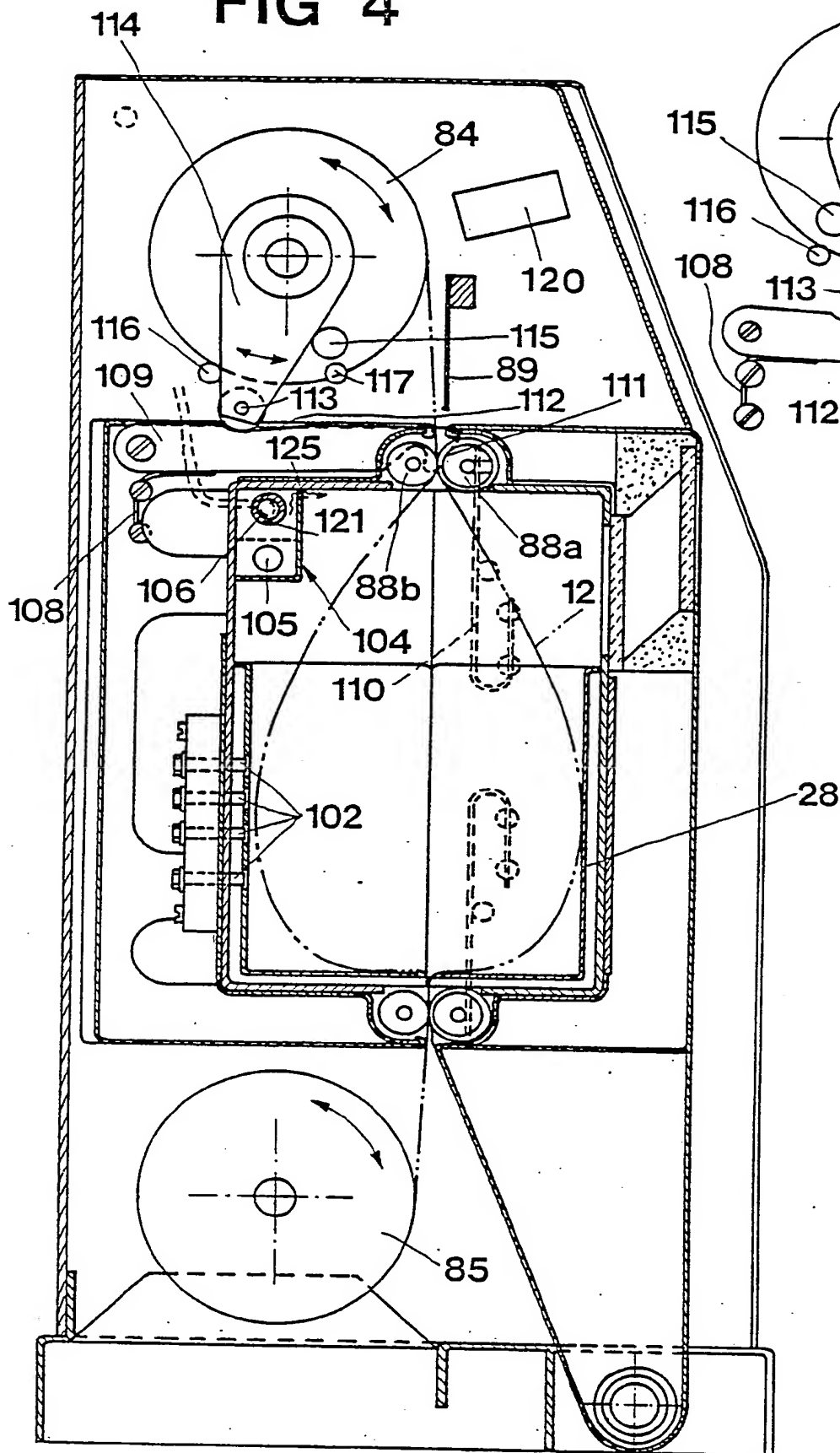


FIG 5

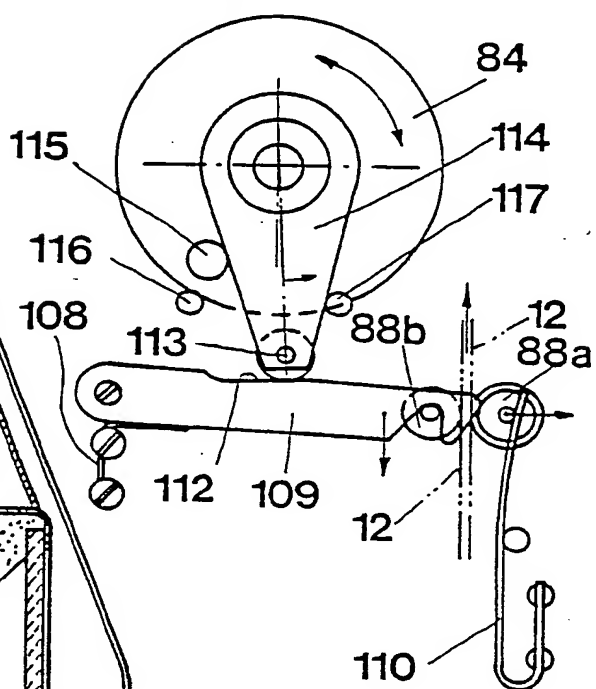


FIG 6

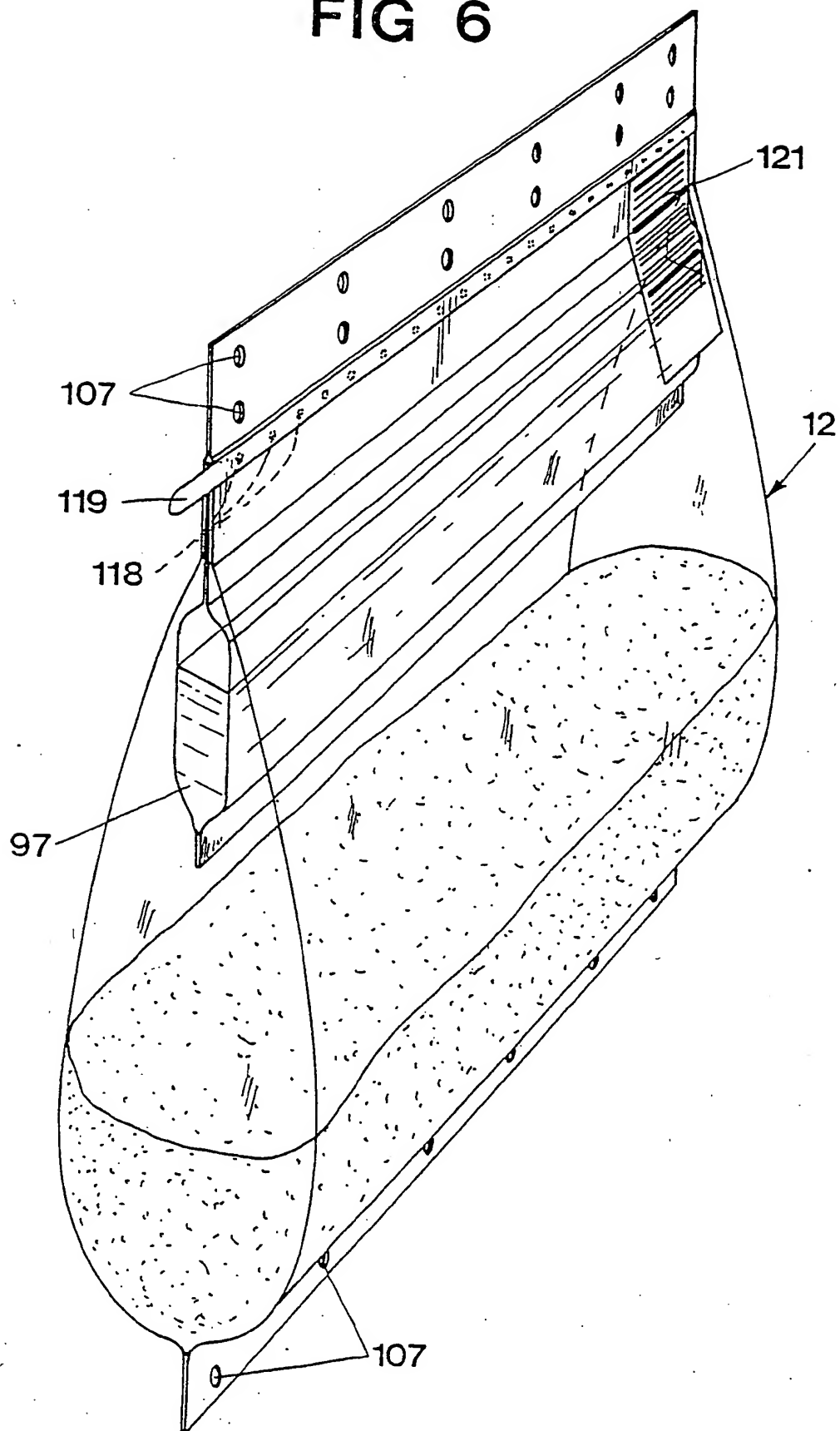
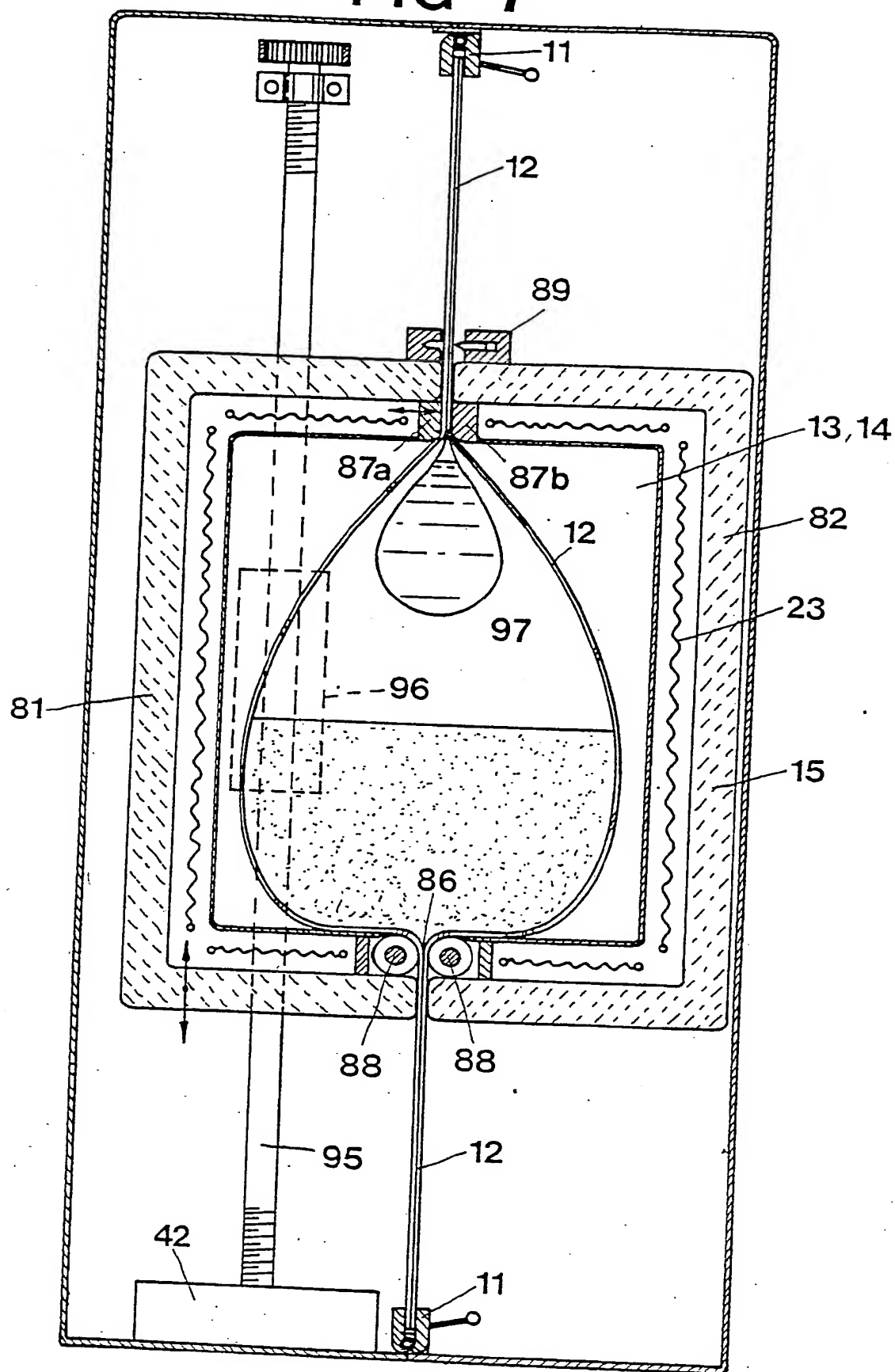


FIG 7



INTERNATIONAL SEARCH REPORT

International Application No

PCT/SE85/00548

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) * According to International Patent Classification (IPC) or to both National Classification and IPC 4 A 01 B 7/00, A 01 C 1/00																										
II. FIELDS SEARCHED <div style="text-align: center; border-top: 1px solid black; border-bottom: 1px solid black;">Minimum Documentation Searched 7</div> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 20%; border-bottom: 1px solid black;">Classification System</th> <th style="border-bottom: 1px solid black;">Classification Symbols</th> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">IPC 4</td> <td style="padding: 5px;">A 21 B 5/00, 7/00; A 21 C 1/00, /08, /14, 7/00, 9/00, 13/00; A 21 D 8/00, /02, /06, 10/00-13/00; A 47 J 37/00, /01 .../...</td> </tr> </table> <div style="text-align: center; border-top: 1px solid black; border-bottom: 1px solid black;">Documentation Searched other than Minimum Documentation to the extent that such Documents are Included in the Fields Searched *</div> <p style="text-align: center; padding: 10px 0;">SE, NO, DK, FI classes as above</p>			Classification System	Classification Symbols	IPC 4	A 21 B 5/00, 7/00; A 21 C 1/00, /08, /14, 7/00, 9/00, 13/00; A 21 D 8/00, /02, /06, 10/00-13/00; A 47 J 37/00, /01 .../...																				
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III. DOCUMENTS CONSIDERED TO BE RELEVANT* <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 10%; border-bottom: 1px solid black;">Category *</th> <th style="width: 60%; border-bottom: 1px solid black;">Citation of Document, 11 with indication, where appropriate, of the relevant passages 12</th> <th style="width: 30%; border-bottom: 1px solid black;">Relevant to Claim No. 13</th> </tr> <tr> <td style="border-right: 1px solid black; vertical-align: top; padding: 5px;">A</td> <td style="border-right: 1px solid black; padding: 5px;">EP, A2, 113 327 (HEDENTTEAM AG) 11 July 1984 & US, 4550654 WO, 84/02449</td> <td style="padding: 5px;"></td> </tr> <tr> <td style="border-right: 1px solid black; vertical-align: top; padding: 5px;">A</td> <td style="border-right: 1px solid black; padding: 5px;">GB, A, 1 402 538 (UNILEVER LTD) 13 August 1975</td> <td style="padding: 5px;"></td> </tr> <tr> <td style="border-right: 1px solid black; vertical-align: top; padding: 5px;">A</td> <td style="border-right: 1px solid black; padding: 5px;">US, A, 2 899 318 (LONG) 31 August 1956</td> <td style="padding: 5px;"></td> </tr> <tr> <td style="border-right: 1px solid black; vertical-align: top; padding: 5px;">A</td> <td style="border-right: 1px solid black; padding: 5px;">US, A, 3 194 185 (SPINOSA) 13 July 1965</td> <td style="padding: 5px;"></td> </tr> <tr> <td style="border-right: 1px solid black; vertical-align: top; padding: 5px;">A</td> <td style="border-right: 1px solid black; padding: 5px;">US, A, 3 873 735 (CHALIN ET AL) 25 March 1975</td> <td style="padding: 5px;"></td> </tr> <tr> <td style="border-right: 1px solid black; vertical-align: top; padding: 5px;">A</td> <td style="border-right: 1px solid black; padding: 5px;">US, A, 4 234 605 (TAKEUCHI) 18 November 1980</td> <td style="padding: 5px;"></td> </tr> <tr> <td style="border-right: 1px solid black; vertical-align: top; padding: 5px;">A</td> <td style="border-right: 1px solid black; padding: 5px;">US, A, 4 304 177 (LOEFFLER ET AL) 8 December 1981</td> <td style="padding: 5px;"></td> </tr> </table>			Category *	Citation of Document, 11 with indication, where appropriate, of the relevant passages 12	Relevant to Claim No. 13	A	EP, A2, 113 327 (HEDENTTEAM AG) 11 July 1984 & US, 4550654 WO, 84/02449		A	GB, A, 1 402 538 (UNILEVER LTD) 13 August 1975		A	US, A, 2 899 318 (LONG) 31 August 1956		A	US, A, 3 194 185 (SPINOSA) 13 July 1965		A	US, A, 3 873 735 (CHALIN ET AL) 25 March 1975		A	US, A, 4 234 605 (TAKEUCHI) 18 November 1980		A	US, A, 4 304 177 (LOEFFLER ET AL) 8 December 1981	
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A	US, A, 4 304 177 (LOEFFLER ET AL) 8 December 1981																									
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>* Special categories of cited documents: 10</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&" document member of the same patent family</p> </div> </div>																										
IV. CERTIFICATION <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border-bottom: 1px solid black; padding: 5px;">Date of the Actual Completion of the International Search</td> <td style="width: 50%; border-bottom: 1px solid black; padding: 5px;">Date of Mailing of this International Search Report</td> </tr> <tr> <td style="border-bottom: 1px solid black; padding: 5px;">1986-03-10</td> <td style="border-bottom: 1px solid black; padding: 5px; text-align: center;">1986-03-13</td> </tr> <tr> <td style="border-bottom: 1px solid black; padding: 5px;">International Searching Authority</td> <td style="border-bottom: 1px solid black; padding: 5px;">Signature of Authorized Officer</td> </tr> <tr> <td style="padding: 5px;">Swedish Patent Office</td> <td style="padding: 5px; text-align: center;"> Anders Bruun </td> </tr> </table>			Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	1986-03-10	1986-03-13	International Searching Authority	Signature of Authorized Officer	Swedish Patent Office	 Anders Bruun																
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II

Fields Searched (cont)

US Cl

99: 325-327, 331, 332, 348;259: 185-190;366: 69-100, 219, 240;425: 175-180, 197-209;426: 128, 410, 496, 594V. ☐ OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE ¹

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. ☐ Claim numbers because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claim numbers because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claim numbers because they are dependent claims and are not drafted in accordance with the second and third sentences of PCT Rule 6.4(a).

VI. ☐ OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING ²

This International Searching Authority found multiple inventions in this international application as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.

2. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:

4. ☐ As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest

☐ The additional search fees were accompanied by applicant's protest.

☐ No protest accompanied the payment of additional search fees.



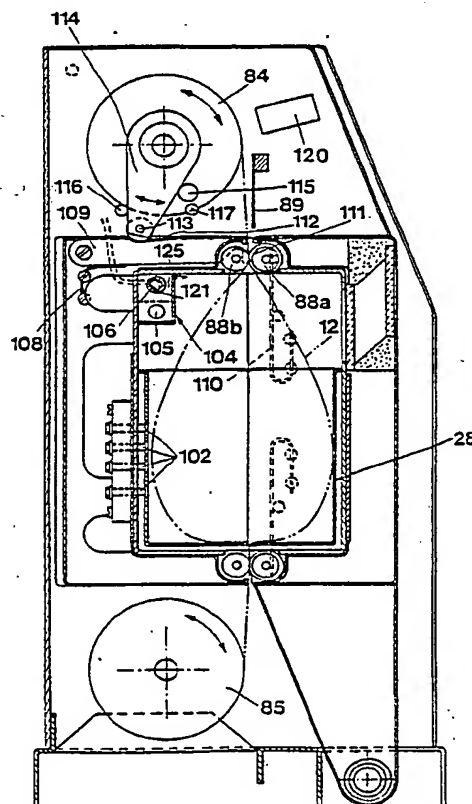
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁴ : A 21 B 7/00, A 21 C 1/00</p>	<p>A1</p>	<p>(11) International Publication Number: WO 86/ 03931 (43) International Publication Date: 17 July 1986 (17.07.86)</p>
<p>(21) International Application Number: PCT/SE85/00548 (22) International Filing Date: 23 December 1985 (23.12.85) (31) Priority Application Number: 84 8396 (32) Priority Date: 27 December 1984 (27.12.84) (33) Priority Country: KR (71) Applicant: HEDENTEAM A.G. [LI/LI]; FL-9497, Triesenberg 9 (LI). (71)(72) Applicant and Inventor: HEDENBERG, Gunnar [SE/SE]; Ejderstigen 15, S-450 33 Grundsund (SE). (74) Agents: ROTH, M. et al.; Göteborgs Patentbyrå AB, Box 5005, S-402 21 Göteborg (SE).</p>		<p>(81) Designated States: AT (European patent), AU, BE (European patent), BR, CH (European patent), DE (European patent), DK, FI, FR (European patent), GB (European patent), IT (European patent), JP, LU (European patent), NL (European patent), NO, SE (European patent). Published With international search report.</p>

(54) Title: AN APPARATUS FOR AUTOMATICALLY MAKING FOOD PRODUCTS SUCH AS BREAD, CAKES AND THE LIKE

(57) Abstract

An apparatus for automatically making food products in piece form from dough-like substances comprising a housing containing holding means (11) adapted to be affixed to either end of a flexible sealable bag (12) containing the ingredients for the dough-like substance, and a dough preparation station (13) having an upper and a lower slit forming slit openings (86); kneading means for mechanically working the ingredients in said bag, said kneading means including the holding means (11) and slit openings (86), and means for creating relative oscillating movement between the bag and the slit openings so that the ingredients are kneaded into a dough-like substance; and a heat treating station (14) in said housing whereby the kneaded dough-like substance is treated, said slit openings (86) each being defined by two guiding means such as sliding surfaces (87) or rollers (88). At least one of the guiding means (87, 88) of at least the upper slit is moveable relative to the other guiding means in that pair so as to allow gas to escape from the bag at the desired time.



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